DYNAMIC ORGANIZATION MODEL AND MANAGEMENT COMPUTING SYSTEM AND METHOD THEREFOR

FIELD OF THE INVENTION

The present invention relates to a organizational database used as an underlying information system to support distributed and collaborative computing in a global enterprise. More particularly, the present invention separates the organization model from the process model, the application model and the data model to provide a dynamic policy-based on organizational resources management system.

BACKGROUND OF THE INVENTION

Computer integrated manufacturing and office automation rely on process modeling and the management of business processes over a distributed and collaborative computing environment. Since business processes often involve different types of corporate resources, their underlying information system must maintain knowledge of and support access to the rapidly changing multidimensional organizational structure and resource relationship to ensure compliance with company business policies and overall system consistency and efficiency.

Business process management (BPM) implementations have historically focused on technologies around process integration, activity coordination, and concurrency control, and to some level, on individual worker productivity (Cheng, E., et. al., 1991, An Open and Extensible Event-based Transaction Manager, *Proceedings of USENIX Conference*; Cheng, E., 1995, Re-engineering and Automating Enterprise-wide Business Processes, *Proceedings of International Working Conference on Information Industry*, Bangkok, Thailand, April; Cheng, E., 1997. *The OMM Model*. Technical Report of the OCT Lab and College of Notre Dame. Belmont, Calif., November. These references are incorporated herein by reference in their entirety.) The view of the organization, and the connection between process and organizational resources, have been characterized as administrative overheads (Howard, M., 1991, Work Flow: the Coordination of Business Processes, *Gartner Group Presentation Highlights*, August). Many BPM systems simply adopt the user model of a relational database management system (RDBMS) as their organization model. However, the user model in RDBMS is designed primarily for isolated transactional operations rather than integrated process activities. The shortcoming of the user model in RDBMS is that it is not adequate to model the flexible resource relationship that is required to support a BPM system.

Other proposed BPM systems start from the process view and tightly couple the organization model with the role model and the process model for an integrated system. These workflow management systems are often workflow applications using information from existing databases to coordinate each user to work towards a common goal by processing instances of workflow types. These integrated BPM systems propose specific role models and methodologies for concurrent engineering. Task assignment rules comprise a static, rule-based methodology specifying which user executes which unit of work. Examples of integrated BPM systems which couple the organization model with the role model and the process model: Bussler, C., 1996, Analysis of the Organization Modeling capability of Workflow-Management-Systems. *PRIISM Conference*.; Di Leva, A., Giolito, P., Vernadat, F., 1997, The M*-OBJECT Organization Model for Enterprise Modeling of Integrated Engineering Environments. *Concurrent Engineering—Research and Applications*, 5(2):183–194.; Su, S. 1986, Modeling Integrated Manufacturing Data with SAM-*, *Computer,* 19(1) :34–49; (Hsu, M., 1991, An Execution Model for an Activity Management System, *Digital Technical Report*, April.; Hsu, M., Kleissner, C., 1996. Objectflow—towards a process management infrastructure, *Distributed and Parallel Databases*, 4(2): 169–194).

Apart from the integrated BPM systems discussed above, former efforts have attempted to address the organizational resource management issue through a directory service. Directory services (DS), and other naming services, aim to support distributed object lookup with a naming convention (see for example, *CCITT Recommendation X.*500 *to X.*521 (1988): *Data Communication Networks, Directory*, Blue Book. Also ISO/IEC Standards ISO 9594-1 to ISO 9594-7.). Each object on the system is assigned a static and universally unique identifier (UUID). This approach yields an efficient solution for simple point-to-point interaction in collaborative software by resolving static addresses for electronic mail, video conferencing, group scheduling and the likes. Nevertheless, DS lacks an organization model and support for dynamic relationships between resources. Consequently, DS fails to support advanced applications such as in publish-and-subscribe where the publisher is not interested in a list of static addresses but would like to identify subscribers based on some correlation between the publishing context and the up-to-date profile of potential target customers.

Overall, the existing organizational resource management approaches suffer from a variety of problems such as the lack of a conceptual organization reference model. A generic solution is needed so that the model can be applied to different concurrent engineering and collaborative computing environments. Although static, task assignment workflow applications may be sufficient for small departments or subgroups within an organization, this simplistic assignment schema is insufficient for complex workflows where responsibility depends on several factors and not only on statically-defined roles. The workflow becomes even more complex with the effective expansion of the organization through intranets and the Internet to a global scale.

Another problem is that some of the prior art organization systems are tightly integrated with the process and application models. Consequently, it is only adequate to support the BPM systems which observe the specific models.

Prior art BPM systems also support only some predefined resource types. For example, network DS focus on machine nodes, users and applications while messaging DS focus on user addresses and the BPM organization sub-components focuses on users, groups and roles. To support the collaboration between the different applications and users, the organization model must be extensible and flexible in order to be able to define resource types of different dimensions which include employees, departments, products, machines, projects, accounts, and others.

Another limitation of prior art BPM systems is that they assume only static and hardwired relationships between resources. In reality, relationships between resources are rapidly changing and the BPM system fails to change with environment it is attempting to represent. To complicate this problem, relationships exist not only among resources of the same type, but also among different types of objects. For instance, there is a many-to-many relationship between the company projects and its employees. Similarly, a three-way relationship can be defined between users, machines, and projects (who is using which machine for which project).